On universality and non-universality for a quantum dot in the Kondo regime

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Abstract. The time-dependent non-crossing approximation is employed for the single-electron transistor to calculate the transient response of the conductance for a variety of temperatures and biases. We consider the case when the dot-lead tunneling constant is suddenly changed such that the Kondo effect is present in the final state. In the fast non-universal timescale, where the charge transfer takes place , we see rapid oscillations. The frequency of these oscillations is equal to the dot level and their amplitude is modulated by the initial and final tunneling constants. To study the slow universal timescale, we develop a new numerical scheme. We compute the conductance for two systems which have different Kondo temperatures down to a fraction of T_K in infinitesimal bias with this scheme. We conclude that universality is preserved as a function of T/T_K. We also investigate the decay rate of recently identified split Kondo peak oscillations down to zero temperature and compare it with the previous analytical results obtained with the perturbative renormalization group.